

## Automatic Realignment and Centering of Gated Perfusion SPECT: Effect on Quantitative Reproducibility.

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**Objectives:** The purpose of this study was to assess the effect of automatic study realignment and centering on SPECT perfusion studies. We hypothesized that automatic realignment and centering about the LV long-axis would improve study reproducibility of quantitatively measured ventricular perfusion and function.

**Methods:** Stress rest gated Tc-99m perfusion studies of 31 consecutive patients (pts) with known or suspected coronary heart disease (CHD) were employed, no exclusions based on body habitus. Study realignment and quantification were performed using a new version of 4D-MSPECT display and analysis software. This new version automatically realigns and centers the LV to its long-axis based on the 3D endocardial surfaces prior to quantification of myocardial function and perfusion. Each stress rest image pair was reoriented into short axis image pairs as carefully as possible using standard reformatting software. Each study was also purposely misaligned + or -5 and 10 degrees in both the transaxial and sagittal oblique planes so that 25% of studies were misaligned 5 and 10 degrees in each of the possible combination of directions about the visual ideal. Variances in the quantitative results were compared with and without automatic realignment and centering. LV ejection fraction, automatically determined summed stress score (SSS), and global and regional quantitative defect extent (Def. Extent) and reversibility (Def Rever.) measurements were compared.

**Results:** Realigned image sets displayed no detectable differences compared to the visual ideally reoriented images irrespective of the magnitude and angles of misalignment. Regional differences by individual coronary territory were even greater and of clinically significant magnitudes compared to the global measure (table). Means and SD for each of these comparisons were significantly reduced by automatic realignment.

**Conclusions:** Automatic realignment and centering within 4D-MSPECT significantly improves the reproducibility of global and regional quantitative measures of LV perfusion and function.

	EF	SSS	Def Extent	Def Rever
Misaligned	2.52±1.42	1.61±1.19	2.92±2.22	3.25±2.66
Auto Realigned	1.17±0.89	0.58±0.44	1.27±0.82	1.36±1.25
p	<0.0001	<0.0001	<0.0005	<0.0005